

Manuscript version: Author's Accepted Manuscript

The version presented in WRAP is the author's accepted manuscript and may differ from the published version or Version of Record.

Persistent WRAP URL:

<http://wrap.warwick.ac.uk/117262>

How to cite:

Please refer to published version for the most recent bibliographic citation information. If a published version is known of, the repository item page linked to above, will contain details on accessing it.

Copyright and reuse:

The Warwick Research Archive Portal (WRAP) makes this work by researchers of the University of Warwick available open access under the following conditions.

Copyright © and all moral rights to the version of the paper presented here belong to the individual author(s) and/or other copyright owners. To the extent reasonable and practicable the material made available in WRAP has been checked for eligibility before being made available.

Copies of full items can be used for personal research or study, educational, or not-for-profit purposes without prior permission or charge. Provided that the authors, title and full bibliographic details are credited, a hyperlink and/or URL is given for the original metadata page and the content is not changed in any way.

Publisher's statement:

Please refer to the repository item page, publisher's statement section, for further information.

For more information, please contact the WRAP Team at: wrap@warwick.ac.uk.

Exploring Two Approaches to an Existential Function of Religiosity in Mental Health

Derek A. Giannone and Daniel Kaplin

The College of New Jersey

Leslie J. Francis

University of Warwick

Author Note

Derek A. Giannone, Department of Psychology, The College of New Jersey; Daniel Kaplin, Department of Psychology, The College of New Jersey; Leslie Francis, Centre for Education Studies, University of Warwick.

Derek A. Giannone is now at the VISN 4 MIRECC, Department of Veterans Affairs, Philadelphia, PA.

Daniel Kaplin holds the copyright to a psychometric instrument utilized in this study, the Drug, Alcohol, and Nicotine scale.

Correspondence concerning this article should be addressed to Derek A. Giannone, Unit 1, 2102 Berges Street, Philadelphia, PA 19125. E-mail: derek.giannone@gmail.com

Abstract

Recent research demonstrates beneficial associations between religiosity and measures of mental health. In this study, we examined whether religiosity benefits mental health (a) by limiting the negative impact of existential concerns, and (b) by enhancing purpose in life. 353 undergraduates completed the following measures: Scale for Existential Thinking, Purpose in Life Test, Religiousness Measure, Center for Epidemiologic Studies Depression Scale – Revised, Generalized Anxiety Disorder-7, and the Drug, Alcohol, and Nicotine scale. We hypothesised (a) that religiosity scores moderate the relationship between existential thinking and mental health, and purpose in life scores mediate the relationship between religiosity and mental health. Religiosity did not moderate the relationships between existential thinking and these outcomes, however, purpose in life scores mediated the relationships of religiosity with depression and anxiety, but not with substance use. Our findings confirm the significance of existential concerns and purpose in life in the religiosity-mental health connection.

Keywords: religiosity; existential concerns; purpose in life; mental health; protective factors

Exploring Two Approaches to an Existential Function of Religiosity in Mental Health

Interest in the connection between religiosity and mental health has increased in recent years (e.g., Bonelli & Koenig, 2013; George, Ellison, & Larson, 2002; Koenig, 2012; Moreira-Almeida, Neto, & Koenig, 2006; Weber & Pargament, 2014). Researchers have found that increased religiosity is associated with a reduction in the symptoms and frequency of mental health conditions such as depression (Bonelli, Dew, Keonig, Rosmarin, & Vasegh, 2012), anxiety (Khalaf, Hebborn, Dal, & Naja, 2015), and substance use (Chitwood, Weiss, & Leukefeld, 2008). Past studies have attempted to identify mechanisms by which religiosity may promote mental health and adaptive coping processes (George, Ellison, & Larson, 2002; Weber & Pargament, 2014). Some have suggested religiosity may reduce the risk of mental health disorders by providing individuals with a framework of meaning to address the complex problems of human existence (Batson & Stocks, 2004; Yinger, 1970), and by facilitating a sense of purpose in life (Pargament, 1997; Steger, 2012; Park, 2013). In this study, we test two existentially-based conceptualizations of the relationship between religiosity and mental health. First, we examine whether religiosity moderates the association between existential thinking and mental health. Second, we examine whether purpose in life mediates the relationship between religiosity and mental health.

Existential Concerns and Religiosity

Due to an awareness of the self and of existence, humans face unique concerns (e.g., mortality, freedom, the nature of reality, the meaning of life) that are difficult to comprehend and resolve in a positive manner (Batson & Stocks, 2004; Emmons, 1999; Yinger, 1970). How individuals process these topics was a primary focus of many early psychologists (Frankl, 1959; Fromm, 1955; May, 1950; Yalom, 1980), and contemporary humanistic-existential psychologists

continue to emphasise their importance to psychological functioning (Hoffman, 2012; Schneider, 2013; Wong, 2012). Supporting the significance of existential issues in psychological functioning, Winston, Sumathi, & Maher (2013) found frequent engagement with these “existential concerns” to be associated with worse mental health in Indian adolescents (Winston, Sumathi, & Maher, 2013). Although this study represents an important preliminary finding, additional research is needed to explore this relationship in a Western context.

Religiosity may determine how individuals process existential concerns and their relationship with mental health. Although attempts to define *religion* are often met with controversy, *religiosity* may be operationally defined as the extent to which an individual attends religious services, reads scripture, prays, and engages in religiously prescribed behavioral restrictions concerning diet and marriage (Hood, Hill & Spilka, 2018). Some theorists have proposed that a primary function of religiosity is to provide a means to address the complex problems of human existence. Yinger (1970) understood religion as “a system of beliefs and practices by means of which a group of people struggle with the ultimate problems of human life” (p. 7), and Geertz (1973) noted that “the religious perspective is a particular way of looking at life, a particular manner of construing the world” (p. 110). This approach has been explored more recently by psychological researchers. Greenberg, Pyszczynski, and Solomon (1986) suggest that fears and uncertainties related to threatening topics (e.g., mortality) are managed by adopting belief systems and participating in social structures such as religion. More recently, Hoffman (2012) identified religion as a system through which people come to understand meaning in existence, death, human limitations, and freedom. Some researchers directly acknowledge this function in their definitions of religion; whereas Pargament (1997) defines religion more generally as a “search for significance in ways related to the sacred” (p. 32),

Batson and Stocks (2004) suggest that “religion may be broadly defined as whatever a person does to deal with existential questions” (p. 141).

Provided with systems of beliefs that address existential concerns, religious individuals may be less likely to respond negatively and more likely to reach positive conclusions when encountering these concerns. Although non-religious individuals develop worldviews and systems of meaning (Wong, 2012), secular systems of meaning may be limited in their ability to address the ultimate concerns of life (Vail et al., 2010). Religious belief systems are unique in their comprehensiveness, imperviousness to disconfirmation, and explanatory power for diverse life events (Spilka, Shaver, & Kirkpatrick, 1985). Religiosity informs not only an understanding of a higher power, but often confers meaning on, and aids coping with, many difficult aspects of life (Emmons, 1999; Pargament, Smith, Koenig, & Perez, 1998; Park, 2013; Silberman, 2005). Complex and subjective topics such as mortality, freedom, human nature, the meaning of life, and the benevolence of the world are commonly addressed by religious belief systems (Koltko-Rivera, 2004; Silberman, 2005). Winston et al. (2013) provides tentative support that religiosity moderates the relationship between existential thinking and mental health; although increased engagement with existential topics correlated with increases in psychopathology among atheists and agnostics in their sample, existential thinking had a less detrimental impact among theists.

Religiosity and Purpose in Life

Engagement with religious belief and practices may also benefit mental health by providing individuals with perceptions of a purposeful and meaningful existence. The connection between religion and meaning was proposed by Frankl (1959) who viewed religiosity as a fulfillment of what he called the “will for *ultimate* meaning” (p. 153), while Clark (1958) suggested that religion provides the most adequate means of satisfying the need for meaning in

life. More recent psychologists have also recognised religiosity as an expression of the need for meaning. In his seminal work, *Meanings of Life*, Baumeister (1991) proposes that people strive toward four distinct types of meaning (i.e., purpose, value, efficacy, self-worth) and connects various aspects of religion to these types of meaning. Others have similarly suggested that religiosity promotes a sense of purpose in life, which drives both daily activities and more ultimate life goals (Pargament, 1997; Park, 2013; Wong, 2012).

A substantial base of research supports claims that religiosity provides followers with a sense of purpose in life, and that this sense of purpose can improve mental health (see Steger, 2012, for a review). Compared with less religious individuals, those scoring higher on measures of religiosity also score higher on measures of purpose in life (French & Joseph, 1999; Hicks & King, 2008; Jewell, 2010). Congruently, Cranney (2013) found that greater confidence in the existence of God is associated with higher scores on purpose in life measures. This connection also extends to religious activities such as church attendance (Robbins & Francis, 2000), bible-reading (Francis, 2000), and personal prayer (Francis & Burton, 2004). Subsequently, the experience of meaning and purpose in one's existence may enhance mental health. Steger (2012) hypothesises that having purpose in life facilitates resilience in the face of adverse life circumstances, while Park (2013) emphasises the ability of religious meaning systems to provide positive direction for life goals, healthy guidelines for behavior, and motivations for living. These approaches are supported by research showing individuals with greater purpose in life report fewer symptoms of both depression (Lester & Badro, 1992; Mascaro & Rosen, 2005, 2008) and anxiety (Ishida & Okada, 2006; Steger, Mann, Michels, & Cooper, 2009), as well as less frequent substance use (Newcomb & Harlow, 1986).

Many studies have examined the role of purpose in life in the relationship between religiosity and psychological well-being. For example, Steger and Frazier (2005) found that among highly religious individuals, those who report more religiously-based meaning exhibited higher self-esteem. Aghababaei and Blachnio (2014) and Sillick and Cathcart (2014) both found a mediating effect of purpose in life on the relationship between religiosity and happiness, such that higher religiosity produced greater happiness through increased perceptions of a purposeful and meaningful existence. However, less research has examined the significance of purpose in life in the relationship between religiosity and mental health. Galek et al. (2015) examined the impact of meaning in life on the relationships between religious commitment and symptom levels of multiple mental health disorders. The results revealed a main moderating effect of meaning in life on the relationship between religious commitment and anxiety. Among non-religious participants, levels of anxiety symptoms remained constant across the different levels of meaning in life that were reported. However, this was not the case among highly religious participants, as those reporting greater meaning in life showed significantly lower anxiety.

The Present Study

In the present study, we examined two potential mechanisms underlying the relationship between religiosity and mental health (i.e., depression, anxiety, substance use) among an undergraduate sample. First, we explored whether religiosity impacts the relationship between existential thinking and mental health. Second, we explored whether the relationship between religiosity and mental health is accounted for by purpose in life. We tested four hypotheses in this investigation; first, existential thinking is positively correlated with depression, anxiety, and substance use; second, religiosity moderates these relationships, such that existential thinking has a less detrimental association with mental health among more religious participants; third,

purpose in life is positively correlated with religiosity, and negatively correlated with depression, anxiety, and substance use; fourth, purpose in life mediates the relationships between religiosity and depression, anxiety, and substance use, such that increased religiosity is associated with decreases in these mental health disorders via increases in purpose in life.

The present study expands upon previous research on existential aspects of religiosity and mental health in several ways. While Winston et al. (2013) examined the impact of existential thinking on mental health in Indian adolescents, we explore this association in a Western sample. We also seek to extend the finding that a belief in God moderates the relationship between existential thinking and mental health by using a multi-faceted operationalization of religiosity. Lastly, we examine the role of purpose in life as a mediator in the relationships between religiosity and three specific measures of mental health. Much previous research has focused on psychological well-being constructs such as happiness and optimism (Aghababaei & Blachnio, 2014; Sillick & Cathcart, 2014; Steger & Frazier, 2005), while fewer studies have conducted similar analyses in relation to mental health symptomatology (Galek et al., 2015). Whereas Galek et al. (2015) explored the moderating effect of purpose in life on the relationship between religiosity and general psychiatric symptoms, the present study addresses existing gaps in the literature by examining purpose in life as an underlying factor in the relationship between religiosity and depression, anxiety, and substance use.

Method

Participants

Participants were 353 (75% female) undergraduates at a small, public liberal arts college in the Northeastern United States. Participants were at least 18 years of age ($M_{age} = 19.42$, $SD = 1.36$, range: 18-29 years), and identified mostly as full-time students (98.3%), White/Caucasian (69.4%), and Christian (57.8%). Table 1 provides a full listing of sample characteristics.

Informed consent was obtained prior to participation, and participants completed the study instruments in an on-campus computer lab through a data-encrypted online research platform. Study instruments were presented using a Latin-squared design to limit ordering effects and contained attention checks to ensure valid responding. Upon completion, participants were debriefed and provided course credit as compensation.

Measures

Existential thinking. Existential thinking was measured using the Scale for Existential Thinking (SET), an 11-item self-report instrument assessing an individual's frequency of engagement with the deeper matters of human existence (Allan & Shearer, 2012). Participants responded to questions such as "Do you ever reflect on your purpose in life?" and "Have you ever reflected on the nature of reality or the universe?" Responses ranged from 1 (*never or rarely*) to 5 (*all the time*). The SET provides a sixth option for participants, "I don't know", which is treated as missing. Missing SET values were imputed with the participants' item averages on the scale. Total scores range from 11 to 55, with higher scores indicating higher levels of existential thinking. Internal consistency for the SET was excellent ($\alpha = .91$).

Religiosity. Religiosity was measured using the Religiousness Measure (REL), a 17-item self-report instrument assessing four religious characteristics (e.g., religious affiliation, belief in god) and implicit religiosity through three different subscales (Sethi & Seligman, 1993). *Religious hope* is assessed with six questions (e.g., "Do you believe that there is a heaven?") with responses ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). *Religious involvement* is assessed using three questions (e.g., "How often do you pray?") with responses ranging from 1 (*less than one time a month*) to 7 (*more than once a day*). *Religious influence* is assessed using three questions (e.g., "How much does religion influence what you eat?") with responses ranging

from 1 (*not at all influential*) to 6 (*extremely influential*). Total scores are calculated by summing the averages of each subscale to provide proper weighting. Overall internal consistency for the REL was excellent ($\alpha = .90$), with acceptable to good internal consistency on the hope ($\alpha = .74$), involvement ($\alpha = .78$), and influence ($\alpha = .88$) subscales.

Purpose in life. Purpose in life was measured using the Purpose in Life (PIL) Test, a 20-item self-report instrument assessing the degree to which individuals experience a purpose-driven and meaningful life (Crumbaugh & Maholick, 1964). In response to statements such as “In life, I have:”, participants rated themselves on item-specific five-point Likert scales such as 1 (*no goals or aims*) to 5 (*clear goals and aims*). Total scores range from 20 to 100, with higher scores indicating higher purpose in life. Internal consistency for the PIL was excellent ($\alpha = .90$).

Depression. Depressive symptoms were measured using the Center for Epidemiologic Studies Depression Scale – Revised (CESD-R), a 20-item self-report instrument assessing the DSM-IV criteria for Major Depressive Disorder (Eaton et al., 2004). Participants were asked to rate how often they experienced various symptoms of depression (e.g., “I could not shake off the blues”) in the past two weeks, with responses ranging from 0 (*not at all or less than 1 day*) to 4 (*nearly every day for two weeks*). Total scores range from 0 to 80, with higher scores indicating higher levels of depressive symptoms. Internal consistency for the CESD-R was excellent ($\alpha = .93$).

Anxiety. Anxiety symptoms were measured using the Generalized Anxiety Disorder (GAD-7) Scale, a seven-item instrument assessing common symptoms of Generalized Anxiety Disorder (Spitzer et al., 2006). Participants were asked to rate the frequency with which they experienced various anxiety symptoms (e.g., “Feeling nervous, anxious, or on edge”) over the past two weeks, with responses ranging from 0 (*not at all*) to 3 (*nearly everyday*). Total scores

range from 0 to 21, with higher scores indicating higher frequency and severity of anxiety symptoms. Internal consistency for the GAD-7 was excellent ($\alpha = .90$).

Substance use. Substance use was measured using the Drug, Alcohol, & Nicotine (DAN) Scale, a 14-item self-report inventory assessing the use of various psychoactive substances (Kaplin, 2019). Participants were asked to report the frequency with which they have used specific psychoactive substances (e.g., alcohol, cannabis, methamphetamines, opioids, sedatives) in the past year, ranging from 0 (*never*) to 8 (*daily*). Scores on individual items are summed to produce a total score ranging from 0 to 104, with higher scores indicating greater substance use. Past validation efforts reveal the DAN Scale to have acceptable face validity, content validity, and intra-class correlation (Kaplin, Cohen, & Dufort, 2019). Ubiquitous caffeine use among the sample posed a threat to construct validity and was removed from the analysis. Internal consistency for the DAN Scale was acceptable ($\alpha = .71$).

Results

Data Analytic Plan

Statistical procedures were conducted using IBM SPSS Statistics for Windows, version 24 (IBM Corp., Armonk, NY, USA) and the PROCESS Macro for SPSS, version 2.16 (Hayes, 2012). Pearson correlation coefficients were used to assess basic relationships among study variables. Descriptive statistics and bivariate correlations among study variables are reported in Table 2. Linear regression procedures were used to test for moderation and mediation effects. Simple slope analysis and Johnson-Neymann calculations were used to probe significant interactions in our moderation analyses. Bootstrapped confidence intervals were used to test the significance of indirect effects in our mediation analyses. A-posteriori power analyses revealed all statistical procedures were adequately powered to detect small to moderate effects at the .05

level of statistical significance. The models were adjusted to account for potential demographic factors, with variables that were significantly associated with the outcome included as covariates. Age was a predictor of substance use ($\beta = .04$, $t = 2.50$, $p = .013$), and sex (0 = Male; 1 = Female) was a predictor of both anxiety ($\beta = .13$, $t = 2.50$, $p = .013$) and substance use ($\beta = -.19$, $t = -3.69$, $p < .001$). Departures from normality and heteroscedasticity of residuals were observed, and log transformations were applied to outcome variables to reduce these violations. Due to unit interpretation issues resulting from the transformations, all regression coefficients presented are fully standardised.

Moderation Analyses

We hypothesised that existential thinking is positively correlated with depression, anxiety, and substance use. As expected, we found significant positive correlations between existential thinking and depression, anxiety, and substance use (See Table 2). Our results indicate that increases in existential thinking correspond to increases in symptoms of depression, symptoms of anxiety, and frequency of substance use. We further hypothesised that religiosity moderates the associations of existential thinking with depression, anxiety, and substance use. Contrary to our hypotheses, religiosity did not moderate the relationships between existential thinking and any of the measures of mental health. The results of these moderation analyses are reported individually below, and the standardised coefficients for the three regression models employed are displayed in Table 3.

Religiosity did not impact the relationship between existential thinking and depression. Existential thinking was associated with increases in depression ($\beta = .25$, $SE = .05$, $p < .001$, 95% CI [.15, .35]), and religiosity was associated with decreases in depression ($\beta = -.26$, $SE = .06$, $p < .001$, 95% CI [-.37, -.15]). However, a non-significant interaction term revealed that the

relationship between existential thinking and depression did not vary as a function of religiosity ($\beta = -.06$, $SE = .05$, $p > .05$, 95% CI [-.16, .04]).

Religiosity did not impact the relationship between existential thinking and anxiety. Controlling for sex, existential thinking was associated with increases in anxiety ($\beta = .25$, $SE = .06$, $p < .001$, 95% CI [.14, .35]) and religiosity was associated with decreases in anxiety ($\beta = -.123$, $SE = .06$, $p = .04$, 95% CI [-.24, -.01]). However, a non-significant interaction term revealed that the relationship between existential thinking and anxiety did not vary as a function of religiosity ($\beta = -.06$, $SE = .05$, $p > .05$, 95% CI [-.14, .03]).

Lastly, religiosity did not impact the relationship between existential thinking and substance use. Controlling for sex and age, increases in existential thinking were associated with increases in substance use scores ($\beta = .17$, $SE = .05$, $p = .002$, 95% CIs [-.06, .27]), and religiosity was associated with decreases in substance use scores ($\beta = -.31$, $SE = .06$, $p < .001$, 95% CI [-.42, -.19]). However, a non-significant interaction term revealed that the relationship between existential thinking and substance use did not vary as a function of religiosity ($\beta = -.05$, $SE = .05$, $p > .05$, 95% CI [-.14, .04]).

Mediation Analyses

We hypothesised that religiosity is positively correlated with purpose in life, and that purpose in life is negatively correlated with depression, anxiety, and substance use. As predicted, we found a significant positive correlation between religiosity and purpose in life, and significant negative correlations between purpose in life and depression, anxiety, and substance use (See Table 2). Our results indicate that increases in religiosity correspond to increases in purpose in life, while increases in purpose in life correspond to decreased symptoms of depression, symptoms of anxiety, and frequency of substance use.

We further hypothesised that purpose in life would mediate the associations of religiosity with depression, anxiety, and substance use. Our predictions were partially supported. Purpose in life was found to completely mediate the relationship between religiosity and depression, and showed a partial mediation of the relationship between religiosity and anxiety trending toward a suppression effect. However, purpose in life did not mediate the relationship between religiosity and substance use. The results of our mediation analyses are reported individually below, and the standardised coefficients for the three regression models employed are displayed in Table 4.

Religiosity was indirectly associated with depression through purpose in life (see Figure 12). Increases in religiosity were associated with increases in purpose in life ($\beta = .38$, $SE = .05$, $p < .001$, 95% CI [.28, .48]), and purpose in life increases were associated with decreases in depression ($\beta = -.46$, $SE = .05$, $p < .001$, 95% CI [-.56, -.35]). A bias-corrected confidence interval revealed a significant indirect effect of religiosity on depression through purpose in life ($\beta = -.17$, $SE = .03$, $p < .001$, 95% CI [-.24, -.12]). Indicating a complete mediation effect, religiosity was not a significant predictor of depression after accounting for this indirect effect ($\beta = -.03$, $SE = .06$, $p > .05$, 95% CI [-.13, .08]).

Religiosity was indirectly associated with anxiety through purpose in life (see Figure 2). Controlling for sex, increases in religiosity corresponded with increases in purpose in life ($\beta = .38$, $SE = .05$, $p < .001$, 95% CI [.27, .49]), and purpose in life increases corresponded with decreases in anxiety ($\beta = -.40$, $SE = .05$, $p < .001$, 95% CI [-.50, -.30]). A bias-corrected confidence interval revealed a significant indirect effect of religiosity on anxiety through purpose in life ($\beta = -.15$, $SE = .03$, $p < .001$, 95% CI [-.22, -.10]). Indicating partial mediation, the total effect of religiosity was non-significant ($\beta = -.05$, $SE = .05$, $p > .05$, 95% CI [-.16, .05]), and remained non-significant after accounting for this indirect effect ($\beta = .10$, $SE = .06$, $p = .09$, 95%

CI [-.01, .21]). Purpose in life trended toward a suppression effect on the relationship of religiosity and anxiety, as the formerly non-significant effect of religiosity on anxiety was marginally significant after controlling for purpose in life ($p = .09$).

Lastly, religiosity was not indirectly associated with substance use through its association with purpose in life. Controlling for sex and age, increases in religiosity corresponded with increases in purpose in life ($\beta = .39$, $SE = .05$, $p < .001$, 95% CI [.28, .49]). However, increases in purpose in life did not correspond with significant decreases in substance use ($\beta = -.06$, $SE = .06$, $p > .05$, 95% CI [-.17, .05]). Indicating the lack of a mediation effect, a bias-corrected confidence interval revealed the indirect effect of religiosity on substance use through purpose in life was not significant ($\beta = -.024$, $SE = .02$, $p > .05$, 95% CI [-.07, .02]).

Discussion

The purpose of this study was to test two existential conceptualizations of the relationship between religiosity and mental health (i.e., depression, anxiety, substance use). First, we hypothesised that participants who more frequently engage with existential topics would also report higher levels of depression, anxiety, and substance use. We found support for our first hypothesis, as participants who more frequently engage with existential concerns also reported higher levels of depression, anxiety, and substance use. These findings are consistent with past research demonstrating that thinking about existential issues such as death and meaning exhibit a deleterious association with mental health (Winston et al., 2013). As previous research was conducted with a sample of Indian adolescents and this study was conducted with American undergraduates, these findings may be specific to younger populations. Guttierrez and Park (2015) suggest college-aged students are often in the process of developing belief systems that address difficult aspects of life, and cognitive engagement with complex and potentially

threatening existential topics may be more likely to engender psychological distress due to their membership in this stage of life.

We further hypothesised that the detrimental impact of existential concerns on mental health would be diminished among our more religious participants. However, religiosity did not moderate the relationships between either existential thinking and depression, anxiety, or substance use. Independent of religiosity, participants who more frequently engaged with existential thought also reported greater depression, anxiety, and substance use. These results contrast with previous research that reported existential thinking to have a less detrimental impact on mental health in theists when compared to atheists and agnostics (Winston et al., 2013). This may be explained by two key differences with previous research. First, the impact of religiosity on existential issues may differ greatly due to cultural differences between American young adults from this sample and the Indian adolescents sampled in Winston et al. (2013). Second, whereas Winston et al. (2013) examined different viewpoints on the existence of God, we utilised a multi-faceted measure of religiosity. This approach might not provide any additional explanatory power, and the hypothesised moderation effect might solely be related to specific religious beliefs such as the belief in God.

We found stronger evidence for our second conceptualization of the relationship between religiosity and mental health, which examined whether religiosity provides mental health benefits by increasing perceptions of a meaningful and purposeful life. The results of our study confirm our hypotheses and replicate past research finding that religious individuals report higher purpose in life compared with their non-religious counterparts (Cranney, 2013; Francis, 2000; Francis & Burton, 2004; French & Joseph, 1999; Hicks & King, 2008; Jewell, 2010; Robbins & Francis, 2000), and that greater purpose in life has a protective effect on depression

(Lester & Badro, 1992; Mascaro & Rosen, 2005, 2008), anxiety (Ishida & Okada, 2006; Steger et al., 2009), and substance use (Newcomb & Harlow, 1986). More broadly, these findings implicate purpose in life as a mechanism through which greater religiosity may provide mental health benefits (Park, 2013; Steger, 2012).

Extending previous research investigating purpose in life as a factor in the connection between religiosity and mental health (Galek et al., 2015), our results revealed that purpose in life completely mediated the relationship between religiosity and depression, as these variables became statistically unrelated after controlling for purpose in life. These findings indicate that the effect of religiosity on mental health functions mainly through the provision of life purpose, and contrast with previous researchers who have emphasised alternative aspects of religiosity as mechanisms of this relationship. In a review of existing literature, Bonelli and colleagues (2012) found that explanations for the impact of religiosity on depression have varied widely; researchers have suggested increased religiosity to be related to fewer symptoms of depression through healthier lifestyle choices, reducing life stressors, improving social support, and increasing both positive emotions and personality traits. However, in our sample, religiosity did not have an impact on depression independent of purpose in life, indicating purpose in life is a more primary mechanism by which religiosity is related to lower levels of depression. Inconsistencies among our findings and previous literature may be attributable to an interrelation between these alternative mechanisms and purpose in life. Past research has found that the experience of a meaningful life is associated with a variety of adaptive factors such as social support, positive emotions, and positive personality traits (see Steger, 2012, for a full review), which may in turn lead to decreases in depression symptoms.

The findings from our analysis of purpose in life as a mediator of the religiosity and anxiety relationship were less straightforward. Purpose in life appeared to demonstrate a slight suppression effect, a statistical phenomenon in which the impact of a third variable produces a non-significant relationship between two other variables. While there was no main effect of religiosity on symptoms of anxiety, religiosity had an indirect effect on anxiety through purpose in life. After controlling for purpose in life, greater religiosity was related to a marginal increase in anxiety, indicating that religious individuals experience higher levels of anxiety in the absence of purpose in life. This finding may reflect the phenomenon of *religious struggle*, a state in which individuals experience psychological distress when they have difficulty finding significance in life despite their religion's views of human existence as meaningful (Pargament, 1997; Pargament et al., 1998). Past research has shown that a perceived lack of meaning in life is related to higher levels of anxiety in religious persons than it is in non-religious persons (Ano & Vasconcelles, 2005).

Lastly, our results did not support the hypothesis that purpose in life mediates the relationship between religiosity and substance use. While greater religiosity corresponded to less substance use, purpose in life did not explain a significant amount of variability in this relationship. Contrasting previous research (Newcomb & Harlow, 1986), more religious participants were less likely to engage in substance use independent of their experience of a meaningful and purposeful existence. Researchers have consistently acknowledged religiosity as a potent protective factor in substance use (Miller & Saunders, 2011), and our findings indicate that the religiosity-substance use relationship does not operate through purpose in life, but through alternative components of religion that are thought to increase psychological well-being (George, Ellison, & Larson, 2002; Keonig, 2012; Miller & Saunders, 2011; Weber & Pargament,

2014), and purpose in life does not appear to be as integral to decreases in substance use observed among more religious persons.

Conclusion

The present study has important limitations that should be recognised. First, the cross-sectional design did not allow for causal explanations of the relationships we examined. For example, we cannot determine whether existential thinking produces worse mental health or mental health difficulties engender existential thinking. Second, we recruited participants from a psychology department containing a disproportionate number of young females, which poses a threat to the generalizability of these findings. Third, our observations were gathered using self-report methods that are susceptible to social desirability bias and response sets. Future research may benefit from the use of narrative approaches or standardised clinical interviews in more diverse samples. Three main conceptual issues should also be noted. First, our religiosity measure did not allow for the testing of how specific religious beliefs alter the negative impact of existential concerns. Second, the purpose in life measure used did not account for qualitative differences among religious affiliations. Purpose in life derived from religiosity may differ from that which develops from a non-religious source. Future researchers should investigate alternative religiosity constructs in relation to existential concerns and qualitative differences in life purpose among varying religious affiliations. Lastly, the statistical models used here are relatively limited in their ability to explore more complicated connections between all the variable of interest. Future researchers should consider utilizing more elaborate procedures (e.g., structural equation modeling) to reveal a more nuanced understanding of this interrelation.

Despite these limitations, we believe our results contribute valuably to the understanding of the relationships between existential thinking, religiosity, purpose in life, and mental health.

This study extends previous research in demonstrating that existential thinking has a negative impact on depression, anxiety, and substance use in a Western sample. The significance of existential issues in mental health has long been emphasised in the humanistic-existential tradition, and this study contributes to the growing base of research providing empirical support to existing existentially-focused theory. While we hypothesised that religiosity would limit the negative impact of existential thinking on mental health outcomes, this suggestion was not supported by our findings. Thus, investigating alternative religious or non-religious variables that may attenuate the mental health impact of existential engagement is an important direction for future research. Moreover, our findings extend previous research on the interrelation between religiosity and purpose in life and demonstrate that purpose in life is an important aspect of the protective effect of religiosity on depression and anxiety. Engaging in religious beliefs and practices serves an existential function by providing followers with a meaningful and purpose-driven life, which subsequently reduces the risk of experiencing depression and anxiety. Future research should focus on qualitative differences in life purpose emerging between the religious and the non-religious, and how those differences may differentially impact mental health outcomes.

References

- Aghababaei, N., & Błachnio, A. (2014). Purpose in life mediates the relationship between religiosity and happiness: evidence from Poland. *Mental Health, Religion & Culture*, 17(8), 827–831. doi:10.1080/13674676.2014.928850
- Allan, B. A., & Shearer, C. B. (2012). The scale for existential thinking. *International Journal of Transpersonal Studies*, 31(1), 21-37. Retrieved from:
<http://www.transpersonalstudies.org/ImagesRepository/ijts/Downloads/Allan%20&%20Shearer%20IJTS%2031%281%29-2012%20%282%29.pdf>
- Ano, G. G., & Vasconcelles, E. B. (2005). Religious coping and psychological adjustment to stress: A meta-analysis. *Journal of Clinical Psychology*, 61(4), 461-480. doi: 10.1002/jclp.20049
- Batson, C. D., & Stocks, E. L. (2004). Religion: Its core psychological functions. In J. Greenberg, S. L. Koole, & T. Pyszczynski (Eds.), *Handbook of experimental existential psychology* (pp. 141-155). New York, NY: Guilford Press.
- Baumeister, R. F. (1991). *Meanings of life*. New York, NY: Guilford Press.
- Bonelli, R. M., Dew, R. E., Koenig, H. G., Rosmarin, D. H., & Vasegh, S. (2012). Religious and spiritual factors in depression: Review and integration of the research. *Depression Research and Treatment*, 2012, 1-8. doi:10.1155/2012/962860
- Bonelli, R. M., & Koenig, H. G. (2013). Mental disorders, religion and spirituality 1990-2010: A systematic evidence-based review. *Journal of Religion and Health*, 52(2), 657-673. doi: 10.1007/s10943-013-9691-4

- Chitwood, D. D., Weiss, M. L., & Leukefeld, C. G. (2008). A systematic review of recent literature on religiosity and substance use. *Journal of Drug Issues*, 38(3), 653–688. doi:10.1177/002204260803800302
- Clark, W. H. (1958). *The psychology of religion: An introduction to religious experience and behavior*. New York, NY: MacMillan.
- Cranney, S. (2013). Do people who believe in God report more meaning in their lives? The existential effects of belief. *Journal for the Scientific Study of Religion*, 52(3), 638–646. doi:10.1111/jssr.12046
- Crumbaugh, J. C., & Maholick, L. T. (1964). An experimental study in existentialism: The psychometric approach to Frankl's concept of noogenic neurosis. *Journal of Clinical Psychology*, 20, 589-596. doi: 10.1002/1097-4679
- Eaton W. W., Muntaner, C., Smith, C., Tien, A., & Ybarra, M. (2004). Center for Epidemiologic Studies Depression Scale: Review and revision (CESD and CESD-R). In: Maruish M. E. (Ed.), *The use of psychological testing for treatment planning and outcomes assessment* (3rd ed., pp. 363-377). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.
- Emmons, R. A. (1999). *The psychology of ultimate concerns: Motivation and spirituality in personality*. New York, NY: Guildford Press.
- Francis, L. J. (2000). The relationship between bible reading and purpose in life among 13-15 year olds. *Mental Health, Religion, & Culture*, 3(1), 27-36. doi: 10.1080/13674670050002072
- Francis, L. J., & Burton, L. (1994). The influence of personal prayer on purpose in life among Catholic adolescents. *Journal of Beliefs and Values*, 15(2), 6–9. doi:10.1080/1361767940150202

- Frankl, V. (1959). *Man's search for meaning*. Boston, MA: Beacon Press.
- French, S., & Joseph, S. (1999). Religiosity and its association with happiness, purpose in life, and self-actualisation. *Mental Health, Religion, & Culture*, 2(2), 117-120. doi: 10.1080/13674679908406340
- Fromm, E. (1955). *The sane society*. New York, NY: Holt, Rinehart & Winston.
- Galek, K., Flannelly, K. J., Ellison, C. G., & Sifton, N. R. (2015). Religion, meaning and purpose, and mental health. *Psychology of Religion and Spirituality*, 7(1), 1-12. doi: 10.1037/a0037887
- Geertz, C. (1973). *The interpretation of culture*. New York, NY: Basic Books, Inc.
- George, L. K., Ellison, C. G., & Larson, D. B. (2002). Explaining the relationships between religious involvement and health. *Psychological Inquiry*, 13(2), 190-200. doi: 10.1207/s15327965pli1303_04
- Greenberg, J., Pyszczynski, T., & Solomon, S. (1986). The causes and consequences of a need for self-esteem: A terror management theory. In R. F. Baumeister (Ed.), *Public self and private self* (pp. 189-212). New York, NY: Springer
- Gutierrez, I. A., & Park, C. L. (2015). Emerging adulthood, evolving worldviews: How life events impact college students' developing belief systems. *Emerging Adulthood*, 3(2), 85-97. doi: 10.1177/2167696814544501
- Hayes, A. F. (2012). PROCESS: A versatile computational tool for observed variable mediation, moderation, and conditional process modeling [White paper]. Retrieved from <http://www.afhayes.com/public/process2012.pdf>

- Hicks, J. A., & King, L. A. (2008). Religious commitment and positive mood as information about meaning in life. *Journal of Research in Personality*, 42(1), 43–57.
doi:10.1016/j.jrp.2007.04.003
- Hoffman, L. (2012). An existential-phenomenological approach to the psychology of religion. *Pastoral Psychology*, 61, 783-795. doi: 10.1007/s11089-011-0393-0
- Hood, R. W., Hill, P. C., Spilka, B. (2018). *The psychology of religion: An empirical approach* (5th ed., pp. 16-17). New York, NY: Guilford Press.
- Ishida, R., & Okada, M. (2006). Effects of a firm purpose in life on anxiety and sympathetic nervous activity caused by emotional stress: Assessment by psycho-physiological method. *Stress and Health*, 22(4), 275-281. doi: 10.1002/smi.1095
- Jewell, A. (2010). The importance of purpose in life in an older British Methodist sample: Pastoral implications. *Journal of Religion, Spirituality, & Aging*, 22(3), 138–161.
doi:10.1080/15528030903321170
- Kaplin, D., Cohen, F., & Dufort, D. (2019). *Exploratory factor analysis of the DAN Scale for substance use disorders: A validation study*. Manuscript submitted for publication.
- Khalaf, D. R., Hebborn, L. F., Dal, S. J., & Naja, W. J. (2015). A critical comprehensive review of religiosity and anxiety disorders in adults. *Journal of Religion and Health*, 54(4), 1438–1450. doi:10.1007/s10943-014-9981-5
- Koenig, H. G. (2012). Religion, spirituality, and health: The research and clinical implications. *International Scholarly Research Network Psychiatry*, 2012, 1-33. doi: 10.5402/20112/278730
- Koltko-Rivera, M. E. (2004). The psychology of worldviews. *Review of General Psychology*, 8(1), 3-58. doi: 10.1037/1089-2680.8.1.3

Lester, D., & Badro, S. (1992). Depression, suicidal preoccupation and purpose in life in a subclinical population. *Personality and Individual Differences*, 13(1), 75–76.

doi:10.1016/0191-8869(92)90221-a

Mascaro, N. & Rosen, D. H. (2005). Existential meaning's role in the enhancement of hope and prevention of depressive symptoms. *Journal of Personality*, 74(3), 987-1013. doi:

10.1111/j.1467-6494.2005.00336.x

Mascaro, N. & Rosen, D. H. (2008). Assessment of existential meaning and its longitudinal relations with depressive symptoms. *Journal of Social and Clinical Psychology*, 27(6),

576-599. doi: 10.1521/jscp.2008.27.6.576

May, R. (1950). *The meaning of anxiety*. New York: W.W. Norton & Company

Miller, M. L., & Saunders, S. M., (2011). A naturalistic study of the associations between changes in alcohol problems, spiritual functioning, and psychiatric symptoms.

Psychology of Addictive Behaviors, 25(3), 455-461. doi: 10.1037/a0022224

Moreira-Almeida, A., Neto, F. L., & Koenig, H. G. (2006). Religiousness and mental health: A review. *Revisita Brasileira de Psiquiatria*, 28(3), 242-250. doi: 10.1590/S1516-

44462006005000006

Newcomb, M. D., & Harlow, L. L. (1986). Life events and substance use among adolescents:

Mediating effects of perceived loss of control and meaninglessness in life. *Journal of*

Personality and Social Psychology, 51(3), 564–577. doi:10.1037/0022-3514.51.3.564

Pargament, K. I. (1997). *The psychology of religion and coping: Theory, research, practice*. New York, NY: Guilford Press.

- Pargament, K. I., Smith, B. W., Koenig, H. G., & Perez, L. (1998). Patterns of positive and negative religious coping with major life stressors. *Journal for the Scientific Study of Religion*, 37(4), 710-724. doi:10.2307/1388152
- Park, C. L. (2013). Religion and meaning. In R. F. Paloutzian & C. L. Park (Eds.), *Handbook of the psychology of religion and spirituality* (2nd ed., pp. 357-379). New York, NY: Guilford Press.
- Robbins, M. & Francis, L. J. (2000). Religion, personality, and well-being: The relationship between church attendance and purpose in life. *Journal of Research on Christian Education*, 9(2), 223-238. doi:10.1080/10656210009484908
- Schneider, K. J. (2013). *The polarized mind: Why it's killing us and what we can do about it*. Colorado Springs, CO: University Professors Press.
- Sethi, S., & Seligman, M. E. P. (1993). Optimism and fundamentalism. *Psychological Science*, 4, 256-259. doi:10.1111/j.1467-9280.1993.tb00271.x
- Silberman, I. (2005). Religion as a meaning system: Implications for the new millennium. *Journal of Social Issues*, 61(4), 641-663. doi: 10.1111/j.1450-4560.2005.00425.x
- Sillick, W. J., & Cathcart, S. (2014). The relationship between religious orientation and happiness: The mediating role of purpose in life. *Mental Health, Religion & Culture*, 17(5), 494-507. doi:10.1080/13674676.2013.852165
- Spilka, B., Shaver, P., & Kirkpatrick, L. A. (1985). A general attribution theory for the psychology of religion. *Journal for the Scientific Study of Religion*, 24(1), 1-20. doi:10.2307/1386272

- Spitzer, R. L., Kroenke, K., Williams, J. B. W., & Löwe, B. (2006). A brief measure for assessing Generalized Anxiety Disorder. *Archives of Internal Medicine*, 166(10), 166(10), 1092-1097. doi:10.1001/archinte.166.10.1092
- Steger, M. F. (2012). Experiencing meaning in life: Optimal functioning at the nexus of wellbeing, psychopathology, and spirituality. In P. T. P. Wong (Ed.), *The human quest for meaning: Theories, research, and applications* (2nd ed., pp. 165-184). New York, NY: Routledge.
- Steger, M. F., & Frazier, P. (2005). Meaning in life: One link in the chain from religiousness to well-being. *Journal of Counseling Psychology*, 52(4), 574–582. doi:10.1037/0022-0167.52.4.574
- Steger, M. F., Mann, J. R., Michels, P., & Cooper, T. C. (2009). Meaning in life, anxiety, depression, and general health among smoking cessation patients. *Journal of Psychosomatic Research*, 67(4), 353–358. doi:10.1016/j.jpsychores.2009.02.006
- Vail, K. E., Rothschild, Z. K., Weise, D. R., Solomon, S., Pyszczynski, T., & Greenberg, J. (2010). A terror management analyses of the psychological functions of religion. *Personality and Social Psychology Review*, 14(1), 84-94. doi: 10.1177/1088868309351165
- Weber, S. R., & Pargament, K. I. (2014). The role of religion and spirituality in mental health. *Current Opinions in Psychiatry*, 27(5), 358-363. doi: 10.1097/YCO.000000000000080.
- Winston, C. N., Sumathi, D. & Maher, H. (2013). Existential inquiries and pathological correlates among Indian adolescents. *Psychology of Religion and Spirituality*, 5(4), 263-271. doi: 10.1037/a0032643

- Wong, P. T. P. (2012). Toward a dual-systems model of what makes life worth living. In P. T. P. Wong (Ed.), *The human quest for meaning: Theories, research, and applications* (2nd ed., pp. 3-22). New York, NY: Routledge.
- Yalom, I. (1980). *Existential psychotherapy*. New York, NY: Basic Books, Inc.
- Yinger, J. M. (1970). *The scientific study of religion*. New York, NY: Macmillan.